

# FLIGHT

*The*  
**AIRCRAFT  
ENGINEER  
&  
AIRSHIPS**

First Aero Weekly in the World  
Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport  
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## Flight

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## EDITORIAL COMMENT

**S**OME very interesting figures relating to the progress made by the French aerial routes have been issued by the French Under-Secretariat of State for Posts and Telegraphs. These figures disclose that, taking the twelve months from October, 1920, to October, 1921, the mail traffic on the London-Paris route has steadily diminished in volume. In October of last year 3,005 postal packets were carried, while in the corresponding month of 1921 this number had fallen to 1,923. It may be remarked that it is quite possible that a good deal of this decrease is due to the fact that regular British lines are running and are obtaining their share of the mail traffic. Nevertheless, the figures are somewhat curious, the more so as we find the same conditions affecting other French lines, which are not subject to outside competition. The Paris-Brussels service shows an astonishing falling-off, only 71 letters being carried last October, as against 621 in the corresponding month of 1920. Paris-Amsterdam shows a decrease from 176 in May last to 35 in October, while the figures of Paris-Strasbourg fell from 115 letters in October, 1920, to 64 in October last.

On the other side of the picture, we find that Paris-Prague rose from 138 packets of mail in 1920 to 863 in October of this year. The Paris-Warsaw route, opened in May last, carried 344 letters in that month against 877 in October. A really wonderful result is shown by the route Toulouse-Casablanca. In October of last year this service carried, out and home, 24,349 postal packets, and in the corresponding month of 1921 this total had increased to 40,607. During the whole year no fewer than 306,181 letters were carried by this service, Paris-London coming next with 28,534.

The deduction to be drawn from these figures seems to be that the business community does not attach a great deal of importance to the saving of a few hours on the shorter aerial routes, but that where the saving of time amounts to days, as it does in the case of the Toulouse-Casablanca route (by which five days are saved in comparison with train and steamer), there is a rush to take advantage of the facilities afforded by the aerial post. The figures are more than a little interesting, and can,

## DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list:

1922.

- Jan. 5 .... Lecture, "Specialised Aircraft," by Wing-Com. W. D. Beatty, before R.Ae.S.  
Jan. 19 .... Lecture, "Aeroplane Installation," by Brig.-Gen. R. K. Bagnall-Wild, before R.Ae.S.  
Feb. 2 .... Lecture, "Radiological Research," by Dr. V. E. Pullin, before R.Ae.S.  
Feb. 7 & 8 Second Air Conference at Guildhall  
Feb. 16 .... Lecture, "Methods of Instruction in Aeroplane Flying," by Sq.-Leader Portal, before R.Ae.S.  
Mar. 2. .... Lecture, "Testing Aircraft to Destruction," by W. D. Douglas, before R.Ae.S.  
Mar. 26-  
April 2 Nice Meeting  
Mar. 30 .... Lecture, "The Design of a Commercial Aeroplane," by Capt. de Havilland, before R.Ae.S.  
July 6-20 French Gliding Competition  
Sept. 2 .... Gordon-Bennett Balloon Race, Geneva  
Sept. .... Tyrrhenian Cup, Italy  
Sept. .... Italian Grand Prix



we think, be studied with advantage by our own postal authorities, who seem dubious as to the advantage or otherwise of using aerial communications to the more distant parts of the Empire. The way they appeal to us is that they prove that the longer the distance over which aerial conveyance is used the more rapid the growth of the traffic and the more successful the enterprise must be.

#### A Ministry of Defence

It is stated on apparently good authority that the Geddes Committee will recommend, on the score of economy, the creation of a Ministry of Defence to control the three fighting services, virtually wiping out the present system of separate administration of the three Departments. Under such a scheme presumably the posts of First Lord of the Admiralty, Secretary of State for War and for Air would disappear and the whole of their functions be vested in the new Minister of Defence.

We see a number of advantages in the proposal, but on the other side there are such grave disadvantages that we cannot regard it with anything but misgiving. There are considerations which are fully as vital to the nation and the Empire as economy, great though the need for this may be. The safety of the commonwealth of the Empire is involved, and the present system, which has served us so well in the past, cannot be lightly interfered with. It is a matter which requires the most serious examination and the gravest consideration before being either adopted or rejected.

The first question that must be answered is whether or not the grouping of the three Services under a single Minister would make for increased efficiency of either or all? The answer seems to be that it might, if the right Minister could be found to fill the post. But the man who could hold the balance evenly, swaying neither to one side nor the other, and who could avoid being biassed towards one service or another by his advisers of one or the other would be a super-man indeed. It may be agreed that if such a man could be found and his successors after him—for we must not lose sight of the fact that men are mortal, and that though one generation might produce the right man it does not follow that another could be found to follow him—the co-ordination of all the fighting Forces of the Crown under one head would be a good thing. That being so, it seems to be strange that no Great Power has ever tried the experiment, nor, to our recollection, has the suggestion ever been received with favour by a great military or naval Power. The Dominions and certain of the smaller Powers have adopted the system of the single Ministry with success, but in their case they are dealing only with small forces and with problems of defence alone. They are not in the position in which they may one day be called to embark upon extensive operations at a long distance from home. In their case the single Ministry means complete co-ordination, while in that of a Great Power it might well mean chaos, owing to confusion of thought and the conflicting ideals of each department of a central Ministry.

It would seem to us, purely as a lay spectator as it were, that a better plan would be—assuming that we require the maximum efficiency and the best possible co-ordination of the Services—to leave things as they are, but to create a real Imperial General Staff in which all three Services shall have

equal weight and voice in settling the problems of strategy with which the Empire may have to deal, and to plan for war as a single operation rather than as a series of watertight operations, so to say. We advance this view with a full sense that it is a matter for the decision of those who have made war their study and upon which the layman can only express opinions with diffidence.

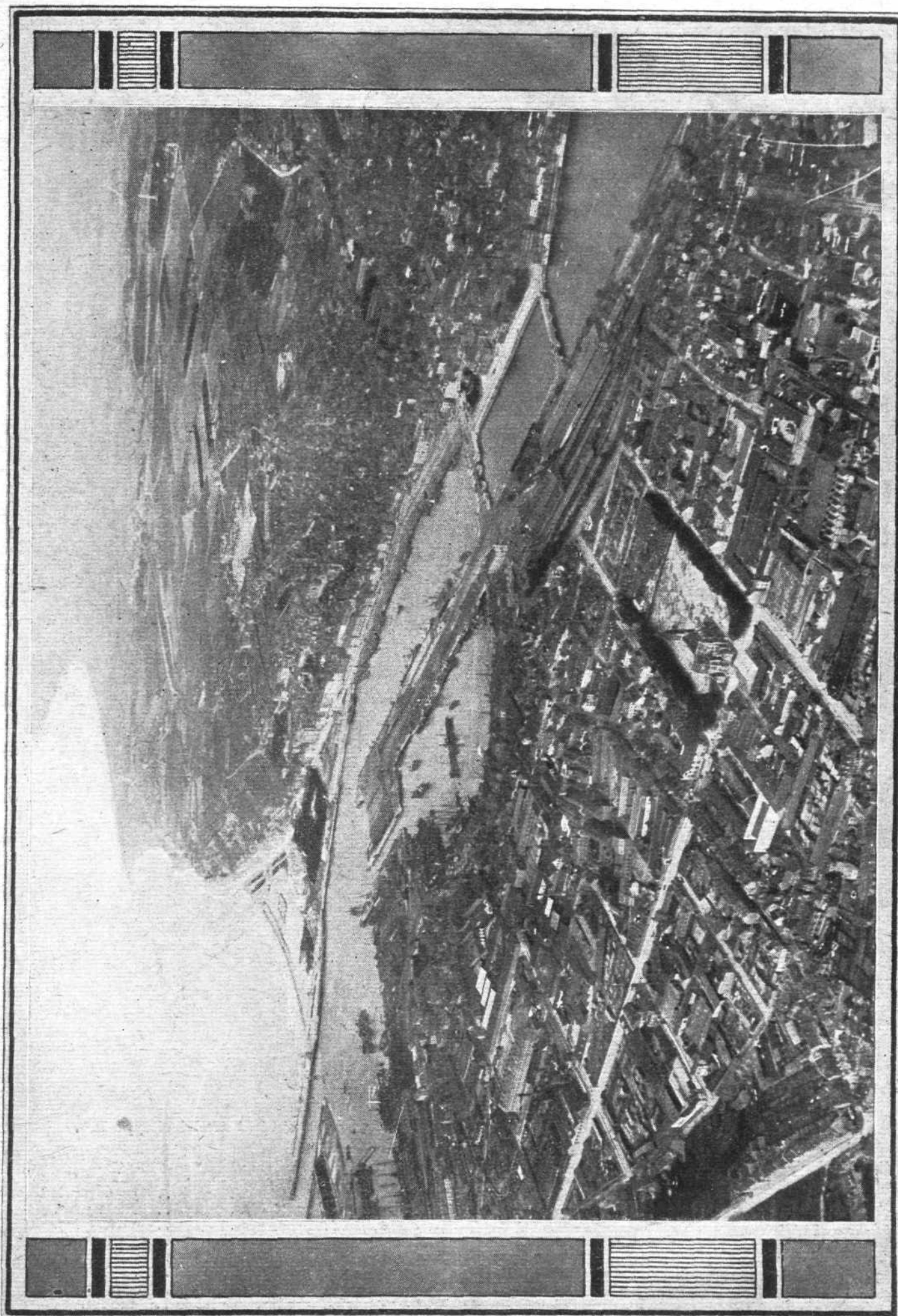
#### Admiral Mark Kerr on Civil Aviation

In a recent issue of the *Observer* Admiral Mark Kerr gives some exceedingly interesting details of a scheme which he assisted to formulate for the institution of an air service between New York and Chicago. The point he seeks to make—and we think he succeeds admirably—is that the address given by Sir Hugh Trenchard before the Scottish Branch of the R. Ae. Society was regrettable and demonstrated an unduly pessimistic view of the future of commercial aviation. We need not follow the gallant Admiral through the whole of the details of the scheme, interesting though they are. What we are principally interested in is the light his letter sheds on the attitude of the American business community towards the new transport. The scheme was prepared at the request of a group of American financial men, the actual work being done by Admiral Kerr, Col. Stedman, late of the R.A.F., and two extremely capable New York business men. They had the further assistance of Mr. Robert M. Cowie, president of the American Express Co., who appears to have given most valuable advice.

After providing for every possible contingency, it was decided that the charge for conveying freight over the distance of about 900 miles should be 30 cents, equivalent to 1s. 3d. per pound weight. This compares quite favourably with the parcel mail charges on our own cross-Channel services. Admiral Kerr says he does not think he is at liberty to quote the exact percentage of profit this rate would show, but he does say that it was a great deal higher figure than is shown by any other mode of transport in the world, and when it is considered that the dividend which was put down for entry into the schedule was one quarter of the profit that would have been made if a single journey each way was carried out with a fully loaded machine, every day in the year, this seems to be a very favourable showing, since it leaves a fair margin for such contingencies as days on which no flying is possible.

As Admiral Kerr remarks, American business men are pretty careful to look all round a scheme before putting their money into it, especially such a new thing as the air, but when they had had the scheme explained to them and had the figures, five times the amount required was to be had. He concludes with the remark that there is no doubt air transport can be made to pay if it is properly organised. We agree. There is not the smallest doubt in the world that it can be made to pay, given organisation and machines properly designed for the work they have to do. The commercial side of aviation has undoubtedly been severely handicapped by having to be carried on with converted war machines. Even then, properly organised services have been able to make their expenses, and now that we are getting to know more about the best methods of running them they are able to make a little profit on the enterprise.





LONDON-PARIS FROM THE AIR, AS SEEN FROM A HANDLEY PAGE MACHINE:  
No. 20.—General view of Boulogne.

Copyright, Handley Page, Ltd





# THE · PARIS · AERO · SHOW · 1921

BY THE TECHNICAL EDITOR

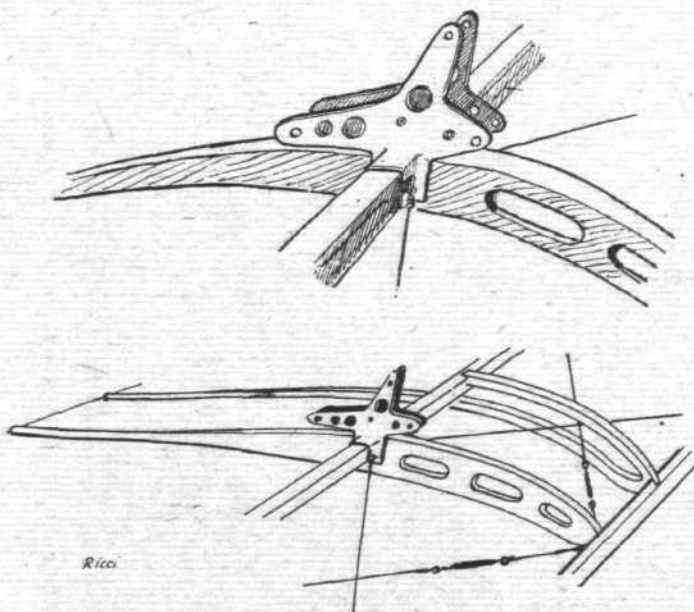
(Continued from page 843.)

## RICCI FRÈRES Lac Lucrino (Baia-Naples), Italy

In the absence of the de Pischoff "avionettes" at the Show, the two triplanes exhibited by the Italian firm were the smallest power-driven aeroplanes in the Grand Palais. Designed for cheap production and low cost of upkeep and running, they possess features with which one is not altogether in agreement; but, as the old saying has it, the proof of the pudding is in the eating thereof, and we are informed that one of these machines has been stunted extensively, and that no sign of structural weakness has been traced. In spite of the appearance of weakness noticed in certain respects it may be that the structural members in question are really sufficiently strong, bearing in mind that the machines are extremely light and of relatively low power.

Generally speaking, the two machines are very similar. Apart from certain differences in dimensions, the two types

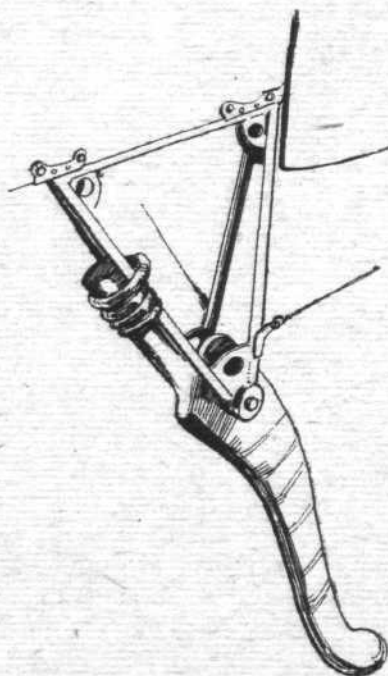
considerable distance out, both fore and aft, along the wing rib. The wing bracing is of piano wire, and certainly the wing structure is of the simplest and cheapest type possible. The ribs are not unlike those of the old Caudrons, i.e. with the front portion double surfaced, and the trailing edge flexible, and with the ribs housed in pockets in the wing fabric. We are informed that on sand tests the wings have shown a factor of safety of 8.5 in the case of the "R.6" and 9 for the "R.9." If the tests were carried out in such a manner that a torsional stress was produced, as well as a direct bending stress, these figures would certainly appear to indicate that the structure is amply strong, and, as already stated, the machines are said to have been put through all sorts of stunts without sustaining any damage.



THE RICCI "POPULAR" AEROPLANES: Details of the single-spar strut attachment.

are distinguished chiefly by the engines fitted. The type "R.6," which is a single-seater, has a 35-40 h.p. Anzani radial, while the "R.9" is fitted with one of the small nine-cylinder le Rhone engines of approximately 50 h.p. The fuselage of both types is of rectangular section in front, but runs off to a triangular section towards the tail.

The triplane wings are chiefly remarkable on account of their being fitted with single spars only. While this is probably quite sufficient for direct bending loads, one is not so certain about the question of torsion with travel of the centre of pressure. The manner of attaching the single inter-plane I-struts to the spar is shown in one of our sketches. The metal shoe is of very light gauge indeed, but it is relieved to a certain extent of some of the torsional load by the fairly long "foot" of the strut, which runs a



The tail skid of the Ricci type R.6.

The main characteristics are as follows:—

	Type "R.6."	Type "R.9."
Engine ..	35-40 h.p. Anzani	50-60 h.p. le Rhone.
Length over all ..	12 ft. 4 ins.	16 ft. 5 ins.
Span ..	11 ft. 6 ins.	14 ft. 9 ins.
Height ..	7 ft. 6 ins.	7 ft. 10 ins.
Wing area ..	118 sq. ft.	140 sq. ft.
Weight empty ..	330 lbs.	440 lbs.
Useful load ..	240 lbs.	350 lbs.
Weight loaded ..	570 lbs.	790 lbs.
Wing loading ..	4.85 lbs./sq. ft.	5.6 lbs./sq. ft.
Power loading ..	14 lbs./h.p.	13.2 lbs./h.p.
Maximum speed ..	90 m.p.h.	96 m.p.h.
Landing speed ..	28 m.p.h.	34 m.p.h.
Duration ..	3 hrs.	3 hrs.

Both machines can be converted into seaplanes by substituting small floats for the wheels. The floats are attached to the same undercarriage, so that the conversion is very quickly carried out. Finally it may be stated that the price quoted is 25,000 lira for the "R.6" and 35,000 lira for the "R.9," equivalent at the present rate of exchange to £270 and £380 respectively. These figures are certainly attractive, and there should be a considerable market for machines with such a good performance at so reasonable a price.

# SOCIÉTÉ ANONYME HOLLANDAISE DE CONSTRUCTIONS AÉRONAUTIQUES

Rokin 84, Amsterdam, Holland

THIS imposing title, on closer examination, proved to be a Pelmanism for N. V. Nederlandsche Vliegtuigenfabriek, otherwise Fokker. It has already been recorded how the French showed their displeasure with the presence at the exhibition of their old enemy, and although one can understand their feelings, it does appear that, having once admitted Fokker to the Show, it would have been more courteous had French patriotism been kept a little more in the background. The proper time for declining to have Fokker machines at the exhibition would obviously have been that of his application for the allocation of a stand. But probably the Dutch guildens were welcome.

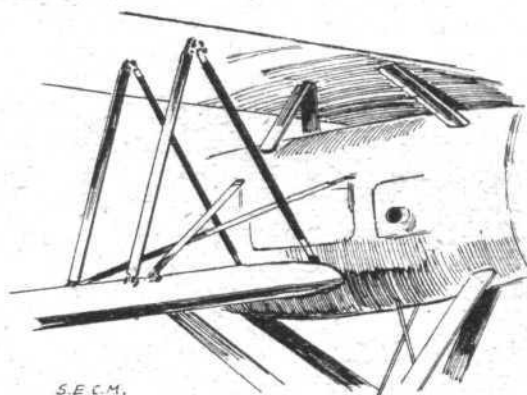
To return to the exhibits on the Fokker stand, one complete machine was shown, a type "F.III," which has already seen a great deal of service on the Amsterdam-London air line. The machine has already been fully described in FLIGHT, and there is thus no necessity to go into details here. The engine is a Siddeley "Puma," and for more than a year the machines have been flying regularly and without accidents, in spite of the relatively low power of the engine. This is due in the first place, to the excellence of the Siddeley "Puma," and, secondly, to the care and attention given to the maintenance of the engines by the K. L. M. ground staff at Croydon and Amsterdam. The cabin accommodates five passengers, who obtain an excellent view downwards, although the wood-covered wing above the cabin tends to make the latter somewhat dark. We noticed with satisfaction that in the machine exhibited an emergency exit had been provided in the roof of the cabin, so that in case of a forced descent in the sea, the passengers would be able to climb out on to the top of the wing.

In addition to the "F.III" Fokker exhibited a monoplane glider, which, in spite of being motorless, somehow retained the typical Fokker lines. We have no figures relating to weight, gliding angle, rate of descent, etc., of this machine, but it was obviously inspired by some of the German gliders which took part in the Rhön gliding competition during the summer. It is claimed that the machine can be trailed behind the aeroplane as a sort of "slip coach," and

## S.E.C.M.

177, Boulevard du Havre, Colombes

ONE believed that the full name of this firm is Société d'Emboutissage et de Constructions Mécaniques. The machine exhibited by this firm was a two-seater, side-by-side school machine of, it was said, metal construction. No particulars were, however, available beyond what one could gather from an external inspection. The machine was fitted



THE S.E.C.M.: Sketch showing wing bracing.

up with electric navigation lights, and under the starboard wing was mounted a searchlight, while under the lower port wing was a windmill-driven generator. The engine was a 110 h.p. le Rhone. The somewhat unusual wing bracing (piano wire in duplicate, with wood fairing in between) is indicated in one of the accompanying sketches.

## RENÉ TAMPIER

1, Rue de Bellevue, Boulogne-sur-Seine

ALTHOUGH generally looked upon as more or less of a freak the machine exhibited by R. Tampier was a serious attempt at discovering how far it is possible to produce an aeroplane which shall be capable of proceeding along a road or street under its own power if for any reason it is desirable to do so. Although frankly an experiment, the machine shown has succeeded in doing this, and so far the experiment is, therefore, to be judged a success. That in the process the extra engine and gear have run away with most—or, at any rate, a large proportion—of the "paying load" is rather beside the point. The designer does not claim that this particular machine has any great usefulness except in proving his theories on a full—or probably it would be more precise to say on a flying—scale. The idea is, we believe, that sooner or later large passenger or goods machines will be so fitted, and



\*\*\*\*\*  
Fokkers at Paris:  
The N. V. Nederlandsche Vliegtuigenfabriek shows an  
"F. III" and a  
small glider of usual  
Fokker construction.

"Flight" Copyright

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that at any time the occupant can cut adrift and glide down, although why anyone should wish to do so is not quite obvious. It would appear that a simpler plan, from every point of view, would be to carry on board a parachute, which would be very much lighter, would offer no resistance when not in use, and would be somewhat less of a film stunt to operate. It seems that the only advantage of the glider, for this particular purpose, is that it can be guided to a particular landing ground once it has been cut adrift. It is doubtful, however, whether this advantage is sufficient to outweigh the numerous drawbacks. As a glider pure and simple, the machine is very neat, and looks as if it should have quite a good performance, provided the weight is not excessive.

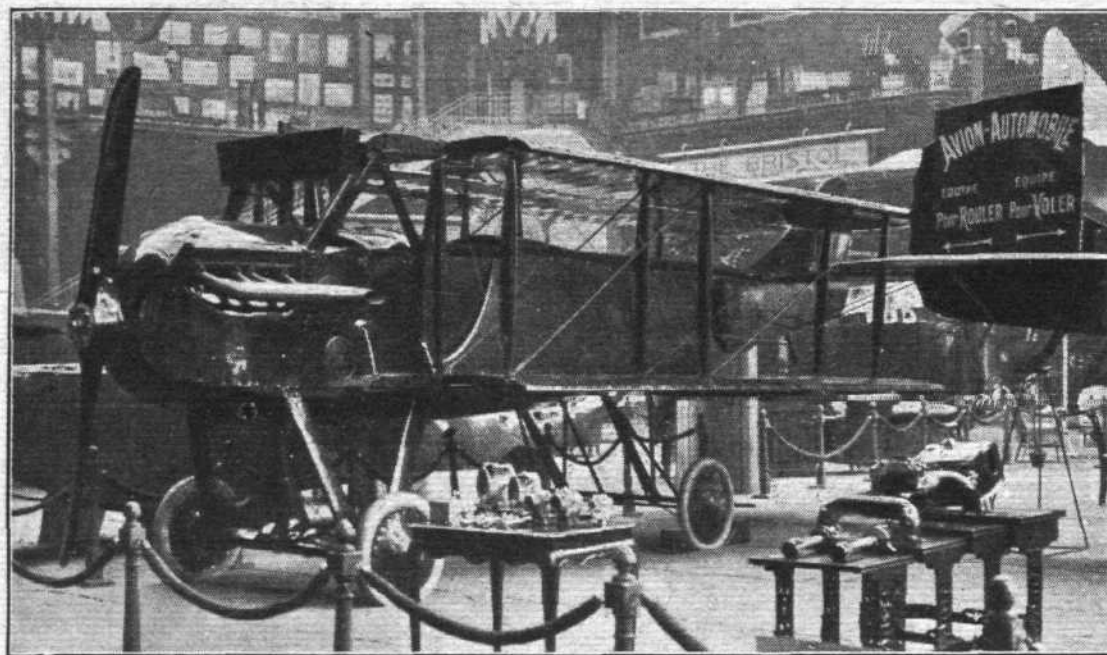
that this will have several advantages. For instance, if a machine is obliged to make a forced landing in a field, it will, it is hoped, be able to fold its wings and proceed by road to the nearest aerodrome where repairs can be effected. Or again, suppose that the aerodrome for which the machine is bound is covered in fog, while a few miles away there is a good bit of landing ground which is clear and free from fog. The machine could then land in clear weather, and, folding its wings, proceed to its destination by road. There is a good deal to be said for the argument, and the idea is less fantastic than one is inclined to think at first. There is all the difference in the world between sending a repair gang out to a field to effect repairs on the spot, or else bring the



machine home in bits, and being able to get the machine to its destination under its own power.

Obviously, it is not feasible to run the machine on the aero engine, as even throttled down to its minimum revs. the engine would be too rapid in acceleration and power to make driving along a road a comfortable task. An auxiliary engine has, therefore, been fitted, which, in the machines exhibited, is of 10 h.p., and, with its transmission, weighs a good deal. On the other hand, in a large machine, the makers of the R. Tampier machine point out, the auxiliary engine can be used for generating current for lighting,

and a reverse, transmits the power to the two main aeroplane wheels. A second set of wheels are mounted on a collapsible structure, coming down from the after portion of the fuselage. These rear wheels are so mounted as to be steerable, and are connected up to the rudder controls. Normally, the machine, when travelling along a road, proceeds tail first, although the reverse drive enables it also to travel nose first. When not in use, the rear undercarriage folds up, and is tucked away inside the fuselage. The two machines shown travelled to the Show under their own power—that is to say, not only up to the entrance, but actually on to their



**The Tampier "Avion-Automobile" has a small auxiliary engine which drives it along the road at about 20 m.p.h., when the wings are folded and the rear wheels let down.**

"Flight" Copyright

wireless, etc., so that its weight is not altogether a dead loss. In other words, it can more or less be made to earn its keep.

Two identical machines were shown on the Tampier stand. They are tractor biplanes with 300 h.p. Hispano-Suiza engines. The wings are arranged to fold back, and in order to occupy as little road width as possible, the trailing edges are made to hinge, so that the two planes lie practically with their rear spars touching one another.

A small 10 h.p. auxiliary engine is housed in front, below and aft of the aero engine, and a car type drive, with four speeds

stand. After the closing of the exhibition, one of the machines was driven through the crowded streets of Paris, climbed the hill at Montmartre, and, returning, travelled back down the hill again. As far as the actual machine is concerned, it has been flown without, apparently, the extra weight of gear, etc., making an appreciable difference to the performance, and it has travelled along many miles of road, being capable of a road speed of about 25 m.p.h. It certainly appears that the idea is worth developing, and it is not inconceivable that in years to come some such arrangement will be found on most commercial machines.

### R.A.F. Cadet College

THE following are declared by the Civil Service Commissioners to be the successful candidates at the competitive examination held in November, 1921, for Cadetships at the Royal Air Force Cadet College; but their admission is conditional on their having passed the medical examination. A table of marks will be sent to each candidate as soon as possible:—

Young, N. ....	12,232	*Thompson, R. O. V. ....	4,845
*Davis, E. S. C. ....	9,615	Drummond-Hay, J. H. ....	4,797
*Edwards, C. C. ....	8,122	Matthews, F. W. M. ....	4,710
*Ommanney, N. D. ....	7,486	Loughman, G. H. ....	4,702
Reedman, R. R. ....	7,271	Hastie, W. A. ....	4,660
Carless, G. P. ....	7,222	Reynolds, J. H. MacC. ....	4,654
*Collins, G. A. B. ....	5,725	*Mason, N. W. F. ....	4,577
Jackson, R. B. H. ....	5,371	Thomas, J. E. G. H. ....	4,545
Holmes, W. ....	5,275	*Sanguinetti, H. R. S. ....	4,501
Fletcher, J. W. M. ....	5,048	Groves, H. M. ....	4,500
Welch, G. L. R. ....	4,864		

*King's Cadet who has qualified*

Armstrong, G. C. A. .... 9,778

\* These candidates have received marks for military efficiency.

### Room 502 for Weather Enquiries

THE Meteorological Office of the Air Ministry announce that enquiries on current weather and requests for forecasts will in future be dealt with in Room 502 on the fifth floor of Canada House, Kingsway, instead of in Room 415 as in the past.

### Commercial Aviation in Algeria

In a report just to hand, by the British Consul-General at Algiers, it appears that the Algerian Assemblies have approved the inscription in the 1922 Budget of a credit of one million francs for the purpose of subsidising certain

aerial services, the proposal being that Paris, Marseilles and Algiers should be connected by an airship service and that aeroplane services should be established between Algiers and Biskra, and Algiers and Casablanca respectively. The exploitation would be in the hands of private companies, who would have to fulfil certain obligations with a view to the immediate adaptation of their organisations to war purposes if required.

The construction of an aviation centre with two hangars at Baraki, near Algiers, is contemplated.

Very shortly an experimental voyage between Marseilles and Algiers is to be undertaken in the "Nordstern," a German dirigible which has been delivered to the French authorities. It is expected that the service will be in operation next year, that the journey from Paris to Algiers will occupy between 16 and 20 hours, and that the cost will not be more than 1,000 francs a head.

### Cairo-Baghdad Air-Mail

THE Postmaster-General states that the Christmas mail, for transmission by air from Cairo to Baghdad, which was dispatched from London on December 15, consisted of 836 letters. The previous Cairo-Baghdad mail which was dispatched on December 1, contained 354 letters, and the November 17 mail contained only 172 letters.

The December 1 dispatch reached Baghdad on December 14. The mail which left Baghdad on December 10 reached Cairo by air on December 14, and letters for this country which were included in it had to be delivered on or about Dec. 23.

### The Health of the R.A.F.

THIS is the title of a report just issued by the Air Council, dealing statistically with the state of health of the Royal Air Force during 1920. Owing to the Xmas holidays, there is no time to deal with the report this week, but we hope to do so in a subsequent issue of FLIGHT.



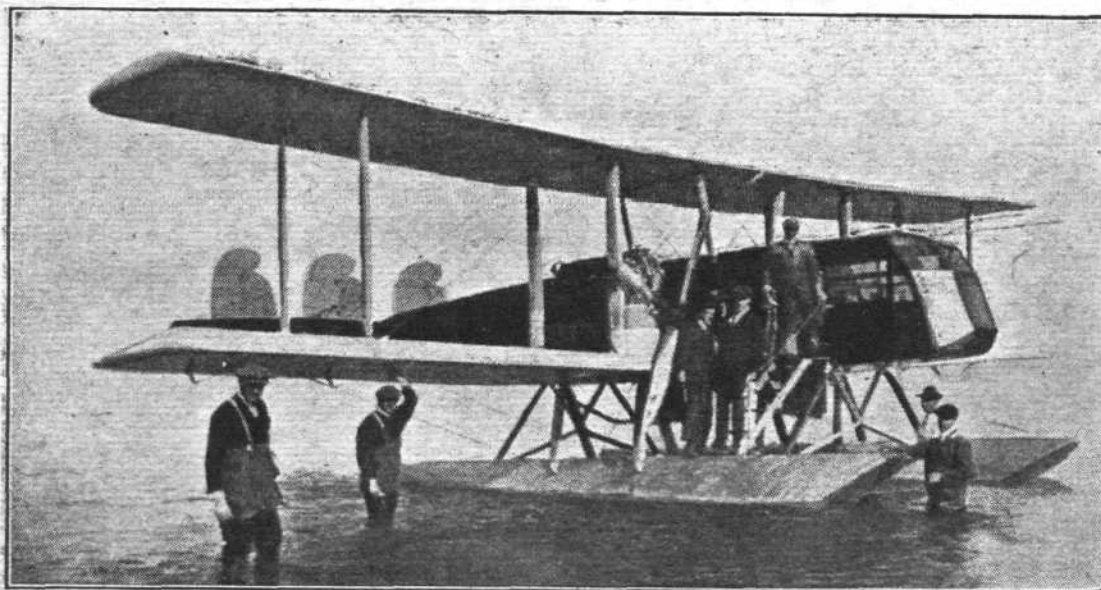
## THE DAYTON-WRIGHT "F.P.2" SURVEY SEAPLANE

ONE of the uses to which aircraft may be put with undoubted advantage is surveying, in which we include forest patrol, aerial photography, mapping, etc. Where such work has to be effected in territories which are practically inaccessible *via terra firma*, aircraft offer exceptional opportunities for successfully carrying out such undertakings. With a view to producing an aeroplane suitable for working under such conditions—especially where there are no other landing facilities than rivers, lakes or sea—the Dayton-Wright Co. of Dayton, Ohio, U.S.A., sent one of their technical pilots to Canada, where such conditions as referred to above prevail, to study the requirements a machine would be called upon to serve in carrying out aerial survey work.

As a result of his investigations, they have just completed

box-spars; the interplane struts are seamless steel tubes of streamline shape.

The *fuselage* is built-up of four spruce *longerons* and several veneer bulkheads, and is covered with a special three-ply. This consists of a core of Balsa wood, and black walnut facings. The forward portion of the *fuselage* forms a totally-enclosed cabin for the pilot and crew, who are thus thoroughly protected against cold, wind and rain, whilst the noise of the engines is also deadened in the cabin. Seats are provided for four persons, arranged in pairs, the front pair being made to swivel so as to face the rear when the machine is at rest on the water, and a folding table may be placed between the four seats. Access to the cabin is from the float by means of a folding ladder and through a large door in the side



The Dayton-Wright "F.P.2" Forest Patrol and Survey Seaplane. The machine is shown as fitted with two (420 h.p.) Liberty engines with tractor screws.

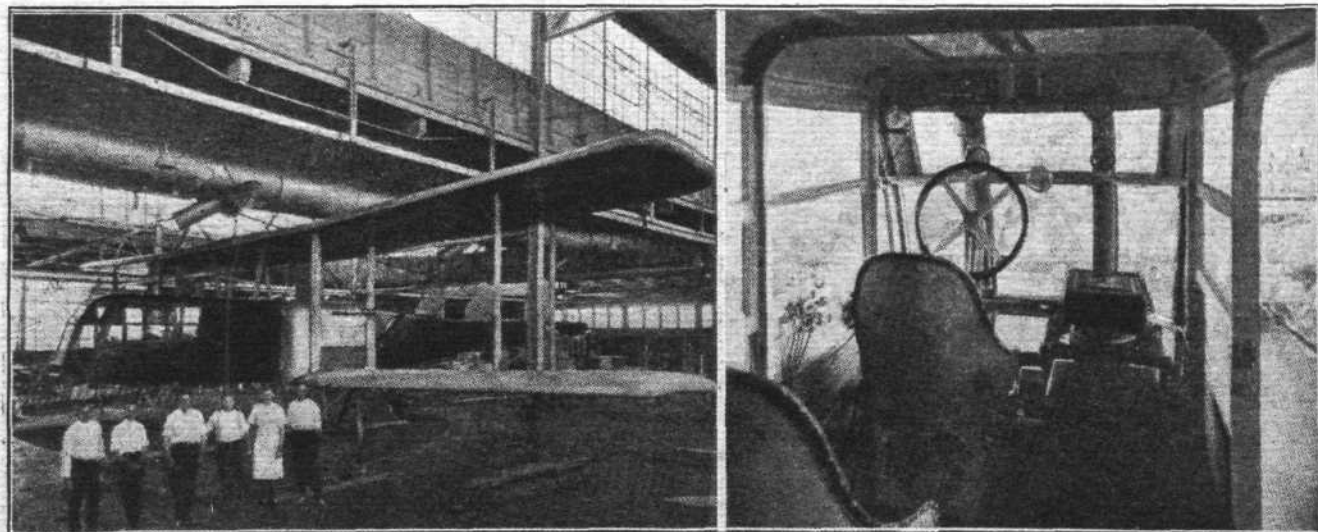
the "F.P.2" seaplane, described and illustrated herewith. Four main factors were taken into consideration in designing this machine, *viz.*:—(1) As wide as possible a range of vision for the occupants; (2) Comprehensive appointments and equipment for the crew; (3) Provisions ensuring the safety of the machine under almost any eventuality; (4) The adaptation of the machine to the special conditions under which it would be called to operate.

The "F.P.2" is a twin-engined, *fuselage* biplane, fitted with twin floats. Upper and lower planes are of equal span, and the outer panels, which are set at a dihedral angle of 2 degrees, are interchangeable—as is also the case with many of the fittings. The wings are fabric covered and built upon

of the *fuselage*; folding doors are also provided in the roof as emergency exits.

Windows let in the sides and bottom of the *fuselage* afford excellent vision sideways, forward and directly downward. The window beside the pilot may be folded out of the way to ensure increased vision. The rear part of the *fuselage* affords a clear space of 15 ft. by 4 ft. by 4 ft. 6 ins., which may be used for stowing baggage, camp equipment, provisions, etc. Folding bunks can also be fitted.

For the power plant two 420 h.p. Liberty engines, driving four-bladed tractor screws, are mounted on the lower plane centre sections. Originally, two 210 h.p. Hall-Scott "L.6" engines were fitted, driving pusher screws, but the former



The Dayton-Wright "F.P.2" Forest, Patrol and Survey Seaplane. On the left, as originally fitted with two (210 h.p.) Hall-Scott engines, and pusher screws. On the right, an interior view of the cabin.

engines have been installed to ensure a larger reserve of power—especially when flying on one engine—and a higher speed.

The twin floats are of the U.S. Naval Air Service type, and are mounted immediately below the engines.

The principal characteristics of the "F.P.2" are:—

Span .. ..	51 ft. 5 ins.
Overall length .. ..	36 ft. 10 ins.
Overall height .. ..	14 ft.
Gap .. ..	7 ft. 8½ ins.
Incidence .. ..	2°
Dihedral .. ..	2°
Wing section .. ..	U.S.A. 27.
Wing area .. ..	668 sq. ft.

Area of ailerons .. ..	88 sq. ft.
Area of tail plane .. ..	53.8 sq. ft.
Area of elevators .. ..	29 sq. ft.
Area of rudders (3) .. ..	28.7 sq. ft.
Area of fins (3) .. ..	20.8 sq. ft.
Weight empty .. ..	5,726 lbs.
Weight loaded .. ..	7,588 lbs.
Weight/sq. ft. .. ..	11.3 lbs.
Weight/h.p. .. ..	9 lbs.
Speed range .. ..	63-120 m.p.h.
Climb in 10 mins .. ..	5,000 ft.
Take off .. ..	22 secs.
Range .. ..	325 miles at 90 m.p.h.

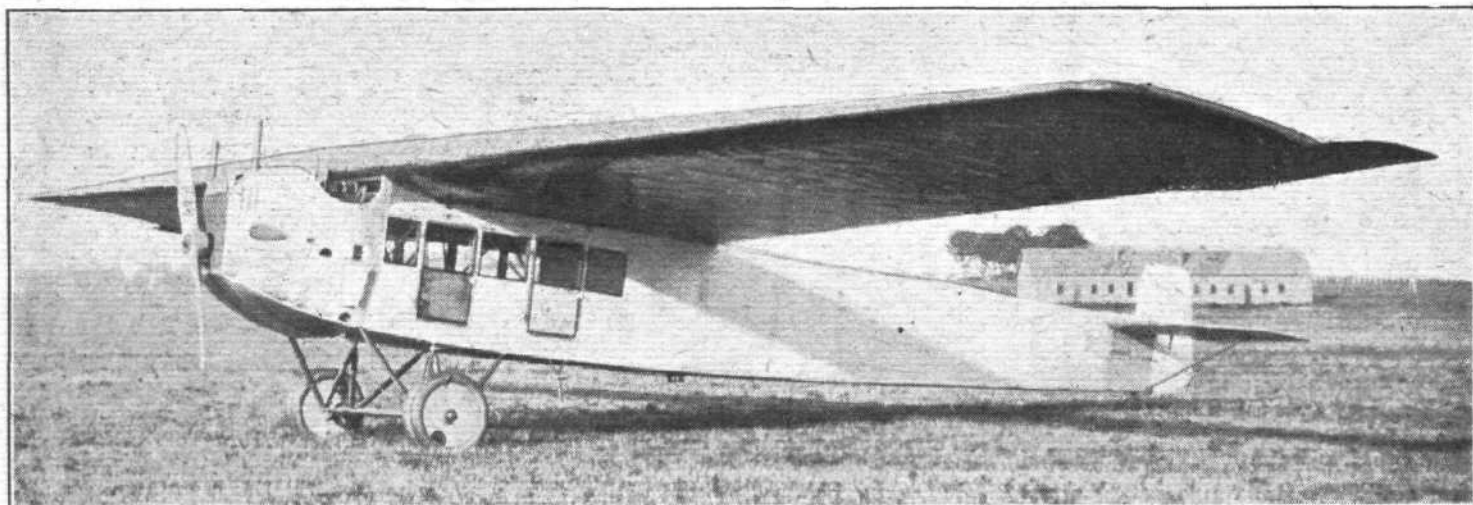
## THE FOKKER "F.IV"

### A Dutch 1922 Model

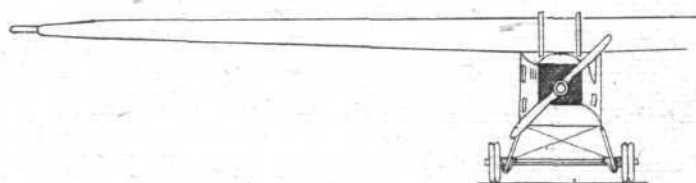
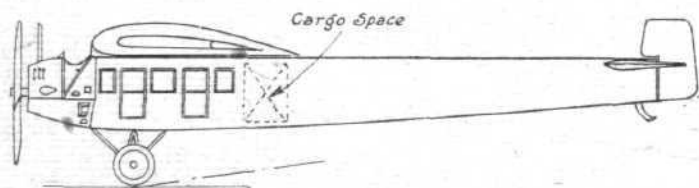
WHILE the Fokker "F.III" has, undoubtedly, done excellent work on the London-Amsterdam service during the past year, it is expected that, as people develop the air habit, the demand for a greater number of passengers will necessitate somewhat larger machines for next year's air lines. It is in

order to meet these anticipated requirements that the Fokker "F.IV" has been designed.

As will be seen from the accompanying illustrations, the "F.IV" resembles in general outline the "F.III," of which it is approximately a geometrical enlargement.



The Fokker "F.IV."—Three-quarter front view.



SPAN 81' 4¼"  
LENGTH 49' 2½"  
HEIGHT 11' 7¼"  
MAX. CHORD 14' 9"

**FOKKER F.IV.**  
380 H.P. Rolls Royce, 400 H.P. Liberty  
or  
450 H.P. Napier Lion Engine

The Fokker "F.IV."—General arrangement drawings.



Minor detail alterations have been incorporated, but these are not apparent from the general views. The fuselage, which appears to be of extraordinary length, is of the same construction as that of the Fokker "F.III," i.e., a steel tube structure with struts and *longerons* joined by welding.

The cabin is divided into two compartments, of which the front one is considerably larger than the aft one. In the larger cabin is seating accommodation for six passengers, three on a sort of sofa running right across the cabin, facing forward, and three separate chairs near the front of the cabin, facing aft. The aft cabin has a single sofa seat for three passengers. Aft of the rear cabin is a luggage compartment which has its own separate door, so that the luggage does not have to be handed through the cabin.

The power plant, which may be a Rolls-Royce "Eagle," a Napier "Lion," or a "Liberty," is installed as in the "F.III," on a tubular framework in the nose of the machine, and the pilot sits behind and slightly to one side of it, his seat being so arranged in the "F.IV," that his head is in

front of, and on a level with, the leading edge of the wing. He therefore obtains a much better view laterally than he did in the "F.III," where he was seated in a scoop in the leading edge.

The wing construction is the same as that of the "F.III," i.e., there are box spars, with three-ply sides and spruce flanges, and the whole of the wing is covered with three-ply. The only innovation appears to be that the wing is divided into two halves, not longitudinally, as one might have expected, but laterally, the entire trailing edge being made as a detachable unit.

With the exception of the features indicated, the Fokker "F.IV," is, as already stated, practically a scale enlargement of the "F.III," whose features have been described in detail in *FLIGHT*, and which are, therefore, well-known to our readers. Suffice it to add that a cruising speed of about 105 miles per hour is anticipated, which should considerably shorten the time taken by the "F.III's" in covering the distance between Amsterdam and London.

## LONDON TERMINAL AERODROME

Monday Evening, December 26.

THE Christmas holidays brought a temporary increase in the air passenger traffic. From Wednesday last week to Saturday there were quite good loads again. On Saturday, for instance, the Grands Express had 10 passengers booked, though only eight of these actually travelled; while on Thursday Handley Page Transport had an overflowing load.

The Instone Air Line has been running through the holidays, even having a D.H. 18 in each direction on Christmas day, and I hear that bookings for next week are already quite good.

There has been considerable activity at the Aircraft Disposal Company during the week, and a number of machines have been flown away to various destinations. Captain Muir, for one, has put in a busy week, flying to Brussels four times and also piloting a machine from Southampton to Croydon. He tells me, incidentally, that the Surrey Flying Services are pushing ahead with their programme for the spring, and are erecting D.H. 9's as well as Avros, intending to begin an air-taxi service on a larger scale than has been attempted hitherto. Taking advantage of strong following winds, which in the upper air were blowing at gale force, Captain Muir, flying one of the Disposal Company's D.H. 9's, made the aerial journey from Croydon to Evere, Brussels, in 1 hour 20 minutes, an average speed of 150 miles an hour.

Mr. Piercy left for Switzerland on one of the aluminium-doped D.H. 9's on Thursday, while on Saturday Mr. Cobham arrived at Croydon from the continent, and travelled on to Stag Lane. Later in the day he returned from Stag Lane with another machine, and requested that the compass should be swung in time for him to leave again for the continent before 8 a.m. on Tuesday morning. He then vanished; so it is not known, yet, whether he has actually completed his 10,000 miles air-taxi trip.

### A New Weather Indicator

A LARGE new board, bearing a painted map of the various London-continental "airways," has now made its appearance ready for fixing alongside the traffic movements' indicator. This new board is to be used for indicating weather at various points along the continental lines, and will have details of wind direction and strength, cloud height, visibility, and general conditions at each of the aerodromes *en route*, these indications being changed hourly.

The aerodrome is getting gradually hemmed in and—as many declare—spoiled. The old aerodrome on the hangar side of Plough Lane is now having railings erected upon it

to mark off various football and sports' grounds. The corrugated-iron fence round the aerodrome itself is growing rapidly, while there are now rumours that alongside the new road to Purley—which has been cut on the eastern side of the 'drome—houses are to be erected. All this ruins the flying approaches to the aerodrome, which are as important as the aerodrome itself. It is bad enough in the daytime, but if commercial night-flying is to come it will be still more detrimental; while it certainly seems a foolish idea to spend money erecting lighthouses and night flying illuminations and, at the same time, permit the approaches to the aerodrome to be impeded.

Already there are scores of obstruction lights round the aerodrome. In addition to buildings and haystacks along the western side, the sheds and buildings at the aircraft factory are marked by red lights, while the chimney of the waterworks in the north-east corner of the aerodrome is to have similar lights fixed. Each time the obstruction lights are required at the factory someone has to walk across the aerodrome to put these on, and then to turn them off when the machine has landed. If houses and sports' pavilions are to be erected, these, too, will require to be indicated by more obstruction lights, and cables would need to be run right across the aerodrome to the control-tower if the arrangement is to be satisfactory. It would seem almost as economical, and certainly more satisfactory from the pilot's point of view, to buy the land and keep it clear from obstructions.

### Air Line Officials in Uniform

THE long-awaited uniforms for the Instone Air Line have now arrived, and various members of the staff appeared in them on Friday and Saturday. They certainly look smart, and add to the dignity of the air-line, having a nautical touch about them. There was, of course, some good-natured chaff—consisting mainly of supposedly nautical remarks.

I hear that there is now another D.H. 18 completed, and that it is at present at Martlesham Heath undergoing type tests—which, I am told, have not yet been carried out on this particular make of machine.

The "impulse tube," which is to be used for shooting parachute-flares and smoke-bombs to a height of 2,000 feet, in foggy and dark weather, has been tried again during the week. The tube itself does not seem to be in proper working order yet, and only manages to get an occasional parachute into the air. This, however, is comparatively easy to overcome, the inventor remarking that it would go better when the varnish was scraped off.

### French Air Line Expansion

FROM Paris it is reported that among the extensions planned by French air line companies during the coming year is the extension by the Compagnie Messageries Aériennes of their London-Paris service to Marseilles. At present Paris is not linked up by air to the south of France, travellers having to proceed to Toulouse by train. If the new line is established it should make a very considerable reduction in the time taken to get to the Riviera *via* Marseilles. It will also link up with the Latécoère lines to Morocco.

### The Michelin Cup.

DECEMBER 31 is the finishing date on which competitors may attempt the flight around France for the Michelin Cup. Unless, therefore, a French pilot manages to put up an

exceptionally fine flight before that date, the Cup will remain in Italian hands for the coming year. At present Martinetti has done the best time over a 3,000 km. circuit, having covered the distance in 35 hrs. 45 mins. elapsed time. On December 21 Major Vuillemin made a plucky attempt to beat Martinetti's performance, but partly owing to fog and adverse weather conditions he had to abandon the attempt after having covered a little more than half of the 3,000 km. course.

### Next Year's Pulitzer.

THE Pulitzer Race, which was won this year by Bert Acosta on the Curtiss-Navy Racer, is to be held next year under the same conditions and over the course originally scheduled for this year's race. At the last moment the scene of the race was, it may be remembered, transferred to Omaha.

# DEVELOPMENTS IN AIRCRAFT DESIGN BY THE USE OF SLOTTED WINGS

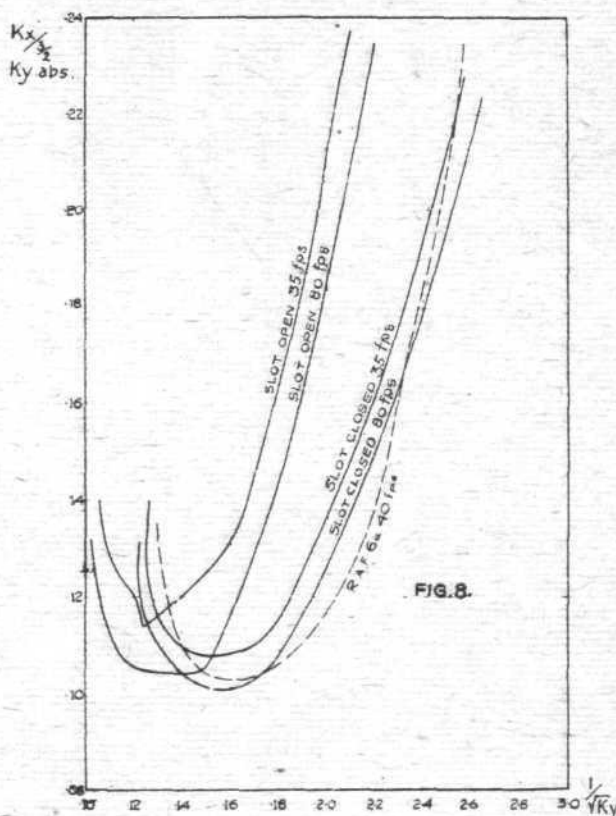
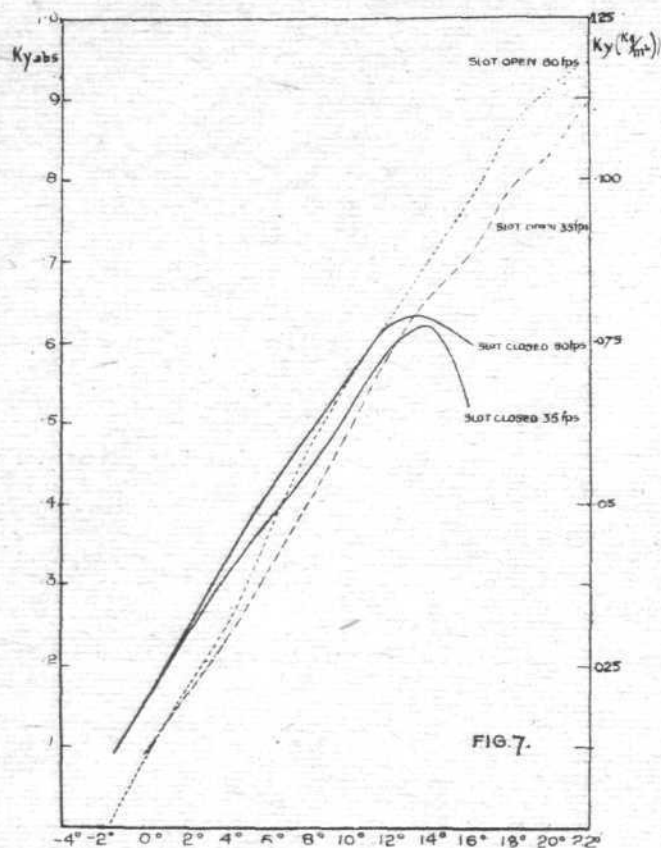
BY F. HANDLEY PAGE

(Concluded from page 846.)

If we examine these Tables, we see that the saving in horse power with the slotted wings, owing to the high loading, is very remarkable. For a landing speed of 50 miles per hour the horse power required for a top speed of 130 miles

per hour is only 208 h.p. with slotted planes, whereas 346 h.p. would be required with a normal plane section. With Airscrew 4 the horse power required is only 293 as against 450 h.p. for a normal section. This great reduction in

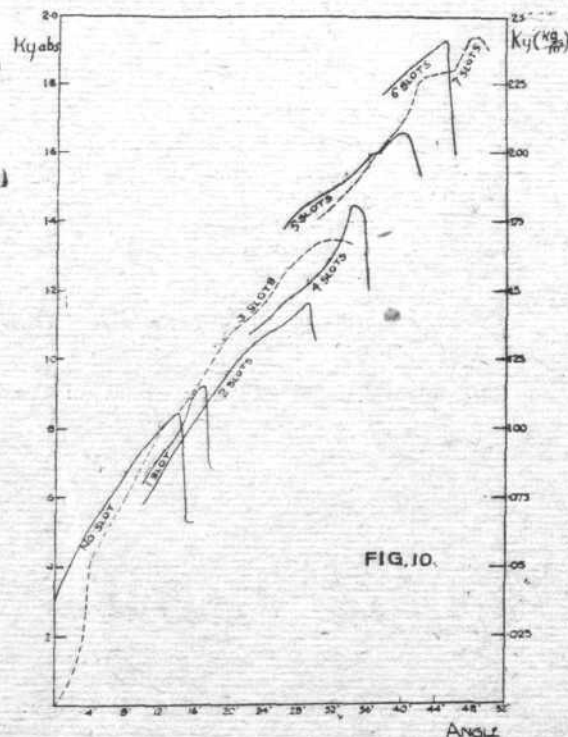
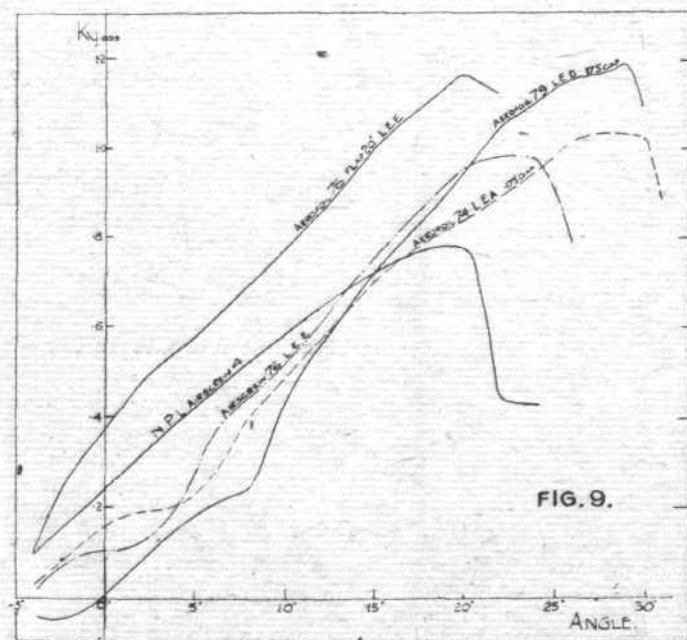
been available for getting off and climbing is no longer necessary, and the pilot can throttle down with consequent great saving of petrol consumption as well as on the wear and tear of the engine.



per hour is only 208 h.p. with slotted planes, whereas 346 h.p. would be required with a normal plane section. With Airscrew 4 the horse power required is only 293 as against 450 h.p. for a normal section. This great reduction in

The loadings for the different planes are also given in the tables, and illustrate clearly the increase in loading that is possible with these high-lift wings.

With higher landing speeds, a saving in horse power could



horse power can be seen all through the tables, approximately 50 per cent. more horse power being required for the plane of normal section. It follows from these results that once the machine is in the air, the extra horse power which has

be effected equally well for the unslotted as for the slotted wings, but the comparison between the two would still show the very great saving by the use of slotted wings.

If, then, the development be made to a limit compatible



with safety in landing, the future will see machines with wings very heavily loaded, say 20 or even 25 lbs. per sq. ft., with the wings nicely streamlined in at their roots into the fuselage, and the fuselage carefully streamlined throughout. Owing to the more efficient planes, the weight will not be such an important feature except from the point of view of climbing, and in consequence more attention and weight can be expended in diminishing head resistance.

Experiments in the wind tunnel have shown that an overall ratio of lift-resistance for the complete machine can be obtained of 15 at the cruising speed of a commercial machine. For a 75 per cent. propeller efficiency such a machine carrying a total load of 6,000 lbs. could fly at a top speed of 150 miles per hour with an expenditure of only 215 h.p. Such a machine would carry 28 lbs. per horse power in the air, and would in consequence be very difficult to get off or climb, especially in hot weather. A larger engine would be required, but the increased economy and reliability effected by the small margin of power required in the air would soon show very remarkable results on the regularity and cost of operation on the service on which it was employed.

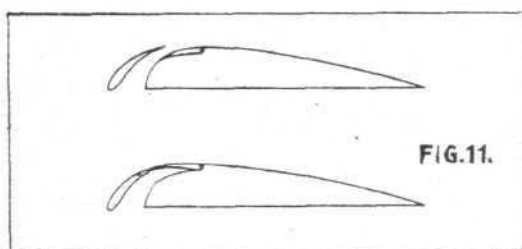


FIG. 11.

The development of the slotted wing design has been one of much research in the wind tunnel, the continued improvement in the results obtained delaying the progress with the mechanical design. The design of the full machine incorporating the slots was delayed until the best type of plane was thoroughly tested out in the wind tunnel. The mechanical details of operation are not very difficult to arrange, and add but little to the weight, a small increase in comparison with the extra lift obtained. It can be definitely said that the weight per sq. ft. of a plane complete with slots is less than that of the unslotted plane for equal lift and landing speed. Two experimental designs are shown in the photographs on pp. 844-845. Those on p. 844 show a standard D.H. 9 biplane with a slotted wing fitted to its front edge. The slot was not of the best type possible, as the front spar was very close to the front edge of the machine, and a good form of slot would have necessitated considerably increasing the chord. On model tests, as well as on the full size of this plane section, an increase of approximately only 40 per cent. was obtained in the lift coefficient with the slot open.

The machine shown in the photographs on p. 845 is a cantilever plane fitted to a standard D.H. 9A fuselage. In the wind tunnel this second machine tested out gave a maximum lift coefficient of .77 absolute units when unslotted, and 1.035 when slotted. The full-size machine was loaded to 11 lbs. a sq. ft. and the machine landed at approximately 43 m.p.h., corresponding to a lift coefficient of 1.17.

This high lift coefficient is interesting as it proves that with the high-lift wings the model results still hold good as with wings of thinner section. In this machine, too, opening and closing of the slot was carried out by means of the rotation of the auxiliary plane controlled by a lever beside the pilot.

From these tests the further design and construction of complete machines is now being proceeded with. There will, however, be a simpler method of operation used in the control of the slot compared with that shown in the photograph. The slot has now been designed so that without movement of the auxiliary plane the forward curvature of the latter forms part of the contour of the high-speed section and the gap in the contour where the slot comes through is closed by a movement of the single wedge-piece, as shown in Fig. 11. Very little force is needed to operate this type of device, as the loading upon it is practically negligible.

In conclusion Mr. Handley Page made reference to some of the structural advantages of the slotted wing and to its application to various types of machines. As the lift is increased, the wings can be built more heavily, thus making possible metal wing construction of a simple and cheap type. Regarding the use of trailing flaps with slots, Mr. Handley Page pointed out these give the advantage of full controllability at large angles, the slot being opened as the flap is pulled down (see Fig. 1). Further, this type of construction has the advantage that a combination of front slot

and slotted flap gives a fairly normal angle of incidence for maximum lift coefficient.

TABLE I.—Slot Open.

Angle of Incidence.	35 feet/second.				80 feet/second.			
	Ky. (abs.)	Kx. (abs.)	L/D.	C.P.	Ky. (abs.)	Kx. (abs.)	L/D.	C.P.
-4	0.009	0.028	—	-2.5	—	—	—	—
0	0.087	0.0254	3.42	0.835	0.081	0.0217	3.73	0.660
4	0.250	0.0257	8.95	0.418	0.245	0.0230	10.6	0.421
8	0.397	0.0324	12.2	0.346	0.456	0.0323	14.1	0.345
12	0.575	0.0510	11.7	0.321	0.630	0.0523	12.0	0.326
14	0.654	0.0599	10.9	0.312	0.700	0.0623	11.0	0.308
16	0.704	0.0718	9.18	0.302	0.766	—	—	—
18	0.785	0.0865	9.08	0.298	0.860	—	—	—
20	0.828	0.0960	8.63	0.293	0.907	—	—	—
22	0.895	0.117	7.65	0.297	0.943	—	—	—
24	0.642	—	—	—	—	—	—	—

TABLE II.—Slot Closed.

-4	0.035	0.0213	—	0.520	—	—	—	—
0	0.155	0.0135	11.5	0.481	0.151	0.0123	12.3	0.489
4	0.312	0.0198	15.8	0.347	0.326	0.0198	16.6	0.336
8	0.435	0.0310	14.0	0.303	0.473	0.0334	14.0	0.301
12	0.582	0.0511	11.4	0.285	0.622	0.0552	11.3	0.273
14	0.628	0.0615	10.2	0.275	0.633	0.0691	9.16	0.275
16	0.523	0.1110	4.71	0.326	0.660	—	—	—

TABLE III.—H.P. required for Planes Slotted and Unslotted. R.A.F./15 Section.

Landing Speed—50 m.p.h. (80 km.p.h.)

Top Speed.	Ky. (abs.)	Kx. (abs.)	H.P. Required.					
			Weights of complete aeroplane.				Loading.	
			5,000 lbs.	7,500 lbs.	10,000 lbs.	15,000 lbs.	lbs. sq. ft.	Kg. m. <sup>2</sup>
130 m.p.h.—								
Slotted	0.162	0.01	139	208	278	416	14	68
Unslotted	0.003	0.0085	231	346	462	692	7.1	34.5
120 m.p.h.—								
Slotted	0.19	0.0115	126	169	252	378	14	68
Unslotted	0.097	0.0087	186	279	372	558	7.1	34.5

Landing Speed—55 m.p.h.

130 m.p.h.—								
Slotted	0.197	0.0118	135	203	270	406	16.8	81.5
Unslotted	0.099	0.0089	203	305	406	610	8.5	41
120 m.p.h.—								
Slotted	0.23	0.0135	122	183	244	366	16.8	81.5
Unslotted	0.116	0.0092	165	247	330	494	8.5	41

TABLE IV.

130 m.p.h.—								
Slotted	0.195	0.0170	195	293	390	586	16.8	81.5
Unslotted	0.126	0.0168	300	450	600	900	10.8	52.5
120 m.p.h.—								
Slotted	0.23	0.0180	162	243	324	486	16.8	81.5
Unslotted	0.148	0.0166	233	350	466	700	10.8	52.5

Landing Speed—55 m.p.h.

130 m.p.h.—								
Slotted	0.235	0.0182	174	261	348	522	20.2	98
Unslotted	0.152	0.0167	247	370	494	740	13	63
120 m.p.h.—								
Slotted	0.277	0.02	150	225	300	450	20.2	98
Unslotted	0.178	0.0169	198	297	396	594	13	63

TABLE V.

130 m.p.h.—								
Slotted	0.22	0.0178	182	273	364	546	19	92
Unslotted	0.126	0.0168	300	450	600	900	10.8	52.5
120 m.p.h.—								
Slotted	0.26	0.0195	156	234	312	468	19	92
Unslotted	0.148	0.0165	233	350	466	700	10.8	52.5

Landing Speed—55 m.p.h.

130 m.p.h.—								
Slotted	0.27	0.0196	163	244	326	488	23	110
Unslotted	0.152	0.0167	247	370	494	740	13	63
120 m.p.h.—								
Slotted	0.315	0.0216	142	213	284	426	23	110
Unslotted	0.178	0.0769	198	297	396	594	13	63

## NOTICES TO AIRMEN

### Phonetic Alphabet for use in Radio-Telephonic Communication

THE following phonetic alphabet which is used in the three Services has been adopted for general use at Government Civil Aviation R/T Stations:—A.—Ac; B.—Beer; C.—Charlie; D.—Don; E.—Edward; F.—Freddie; G.—George; H.—Harry; I.—Ink; J.—Johnnie; K.—King; L.—London; M.—Monkey; N.—Nuts; O.—Orange; P.—Pip; Q.—Queen; R.—Robert; S.—Sugar; T.—Too; U.—Uncle; V.—Vic; W.—William; X.—X-ray; Y.—Yorker; Z.—Zebra.

(No. 107 of 1921.)

### Croydon Aerodrome: Obstruction

AN iron fence is in course of erection along the northern boundary of Croydon aerodrome, about 160 yards from the road.

While the work is in progress the obstruction is marked by black and white chequered flags.

(No. 109 of 1921.)

### Aerodromes for Civil Use: Amendments

NOTICE to Airmen No. 81 (Consolidated List of Aerodromes) of 1st October, 1921, is amended as follows:—

*List C. Licensed Civil Aerodromes.*—The following should be deleted: Lowestoft, Gunton Warren; Porthcawl, Locks Common.

(No. 108 of 1921.)

### Wireless D.F. Stations: List and Borkum Closed; Ouessant Re-opened

1. THE Direction Finding Stations at List and Borkum, details of which were shown in paragraph 5 of Notice to Airmen No. 69 of 1921, are temporarily closed. Further notice will be given when the stations are again brought into operation.

2. The Direction Finding Station at Ouessant, which has been temporarily closed, is now open again for service. Notice to Airmen No. 76 of 1921 is accordingly cancelled.

(No. 111 of 1921.)

## ROYAL AERONAUTICAL SOCIETY NOTICES



*Lectures.*—The next meeting will take place at the Royal Society of Arts, John Street, Adelphi, at 5.30 p.m., on January 5, 1922, when Wing-Commander W. D. Beatty, C.B.E., A.F.C., will read a paper on "Specialised Aircraft."

*Juvenile Lecture.*—The Annual Juvenile Lecture for the children of Members and friends will take place at 3.0 p.m. on January

12, at the Royal Society of Arts, when Major D. C. M. Hume will talk on "Boats that Fly." The lecture will be fully illustrated by lantern slides, etc.

*Royal Aeronautical Society Lecture Programme, 1922, 57th Session.*

January 5, "Specialised Aircraft," Wing-Com. W. D. Beatty; January 12, 3.0 p.m., *Juvenile Lecture*, "Boats that

Fly," Major D. C. M. Hume; January 19, "Aeroplane Installation," Brig.-Gen. R. K. Bagnall-Wild; February 2, "Radiological Research and the Examination of Materials," Dr. V. E. Pullin; February 16, "Methods of Instruction in Aeroplane Flying," Sqdr.-Ldr. C. F. A. Portal; March 2, "Testing Aircraft to Destruction," W. D. Douglas; March 30, "Design of a Commercial Aeroplane," Capt. G. de Havilland; April 6 (Subject to be announced later), M. L. Bequet.

The lectures will be held in the Theatre of the Royal Society of Arts, John Street, Adelphi, at 5.30 p.m., except the Juvenile Lecture, which will take place at 3.0 p.m. Members may obtain tickets for friends, free of charge, on application to the Secretary, Royal Aeronautical Society, 7, Albemarle Street, W.1.

W. LOCKWOOD MARSH,

Secretary

### Italian Government Encourage Aircraft Firms

As a result of the Italian Minister of War's programme for civil aviation, many orders are, it is stated, about to be placed for new machines. They include the following:—

*Fiat.*—Two AL machines, two three-engine machines for 12 passengers and two Deutsch-type machines. The first two machines to carry six passengers each.

*Ansaldo.*—Two 300C biplanes and two 300T biplanes.

*Macchi.*—Two M.18 cabin machines with IF V6 engines, two M.18 economical-type machines with IF V6 engines and two M.20 with Anzani 45 h.p. engines.

*S.I.A.I.*—Two S.13 bis, two S.16 and two S.16 bis machines.

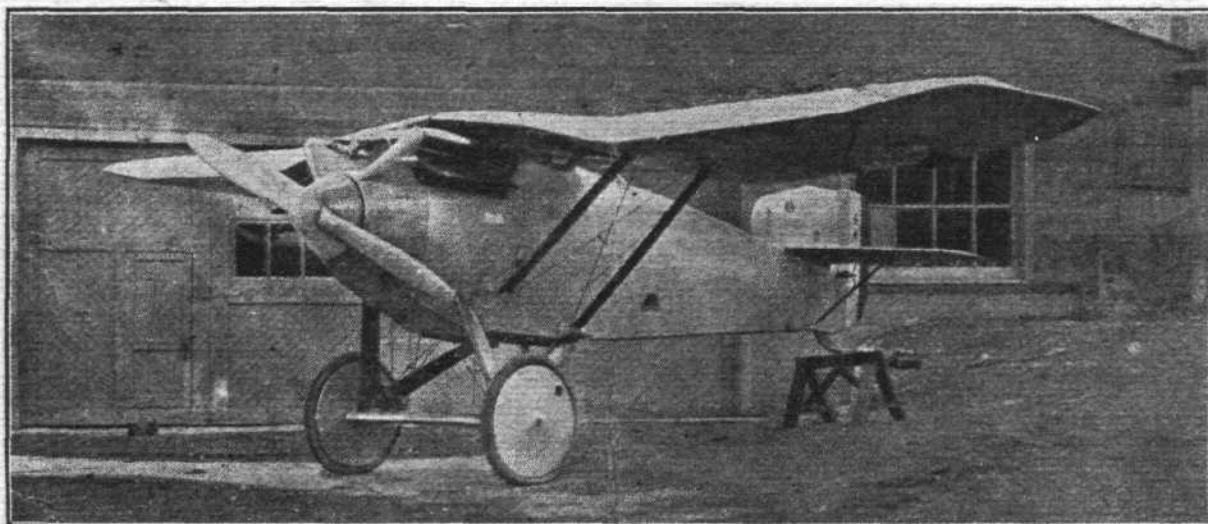
*Caproni.*—Two biplanes 1921 type, 450 h.p. engine.

Orders will also be placed with the Breda Works.

All these machines will be at the disposal of their constructors for competition purposes, but they must be in the hands of the Technical Directorate in two years.

### The "Roma" Flies Again

THE erection of the late Italian semi-rigid airship "Roma," recently purchased by the U.S. Government, was completed sooner than was previously anticipated, and a successful trial flight was carried out on November 15 last, at Langley Field. This maiden flight, which lasted about 3½ hours, was marked by two exciting incidents, firstly by the discovery of a stowaway perched out on the nose of the envelope—where he was delighting in his stolen joy-ride—and, secondly, by the breaking of one of the forward starboard propeller-blades. Splinters from the latter tore holes in the keel covering and in the lower diaphragm of No. 3 gas compartment, but the prompt and plucky action of the engineer in charge of the engine at this section, assisted by two others, in stopping the engine and effecting immediate repairs, prevented any serious trouble. All three men were "gassed," but the "Roma" made a safe landing at the Field.



**THE THOMAS-MORSE "M.B.-7" MONOPLANE:** This machine was flown in the Pulitzer Race by Col. H. E. Hartney, who had engine trouble and crashed. A lighted match from souvenir hunters resulted in the machine being totally destroyed. Span, 24 ft.; chord, 5 ft. 6 ins.; overall length, 18 ft. 6 ins.; total wing area, 112 sq. ft.; weight loaded, 1,975 lbs.; weight/sq. ft., 17.6 lbs.; weight/h.p., 4.98 lbs.; engine, 320 h.p. Wright.



# THE ROYAL AIR FORCE

London Gazette, December 13

**Medical Service**

Group Capt. D. Munro, C.I.E., M.B., F.R.C.S.(E), to be Air-Commodore; November 26.

**Nursing Service**

Miss Constance Abigal Marr is confirmed in her appointment as Staff Nurse; May 23.

**Memoranda**

Lieut. (actg. Capt.) J. P. L. Biggs, M.B.E., relinquishes his temp. commn. on ceasing to be employed and is granted rank of Major; December 1. Permission granted to Sec. Lieut. E. Young to retain his rank is withdrawn on his joining the Army.

London Gazette, December 16

**General Duties Branch**

Flying Officer R. A. W. Powell is cashiered by sentence of General Court-Martial; Oct. 18.

**Memoranda**

Lieut. J. A. H. Savage to be actg. Capt. (from Feb. 14, 1919, to April 30, 1919).

One Cadet is granted an honorary commn. as Sec. Lieut., with effect from the date of demobilisation (since granted short service commn.).

London Gazette, December 20

**General Duties Branch**

The following are granted short service commns. as Flying Offrs., with effect from and with seniority of the dates indicated:—B. A. Davy; December 13. G. F. Mackay, G. G. H. Du Boulay; December 12. J. Marsden; December 7. S. G. Williams; December 9.

Flying Offr. W. Catchpole, A.F.C., is placed on half-pay, Scale B, from November 14 to December 2 inclusive. Flight-Lieut. H. G. Hutchinson, M.B.E., resigns his permanent commn.; December 21. Flying Offr. J. V. Gascoyne, D.F.C., resigns his permanent commn., and is permitted to retain rank of Lieut.; October 25. Flight-Lieut. F. C. Lander, A.F.C., resigns his short service commn.; December 12. Flying Offr. L. H. T. Sloan, A.F.C., relinquishes his short service commn. on account of physical unfitness for flying duties, and is granted rank of Major; December 21. Flying Offr. W. K. Rose is placed on the retired list on account of ill-health contracted in the Service, and is permitted to retain rank of Lieut.; December 21.

**Medical Service**

The following Flight-Lieuts. are granted permanent commns., with effect from July 13, 1920, retaining their present substantive ranks and seniority. *Gazettes* July 13, 1920, appointing these officers to short service commns., are cancelled:—W. F. Wilson, M.C., M.B., P. A. Hall, M.B., B.A., H. B. Troup, E. G. O'Gorman, M.B., T. J. X. Canton, M.B.

## ROYAL AIR FORCE INTELLIGENCE

**Appointments.**—The following appointments in the R.A.F. are notified:—*Squadron-Leader.*—D. C. S. Evill, D.S.C., A.F.C., from R.A.F. Depot (Inland Area) to Headquarters, Coastal Area. 1.1.22.

*Flight-Lieutenants.*—M. B. Frew, D.S.O., M.C., A.F.C., from R.A.F. Cadet College (Flying Wing) (Cranwell) to No. 6 Squadron (Middle East Area). 8.12.21. R. S. Lucy, A.F.C., from No. 24 Squadron (Inland Area) to No. 30 Squadron (Middle East Area). 8.12.21. F. P. Don, from Headquarters (Inland Area) to No. 70 Squadron (Middle East Area). 8.12.21. C. F. Gordon, O.B.E., M.C., D.F.C., from Air Ministry (D.O.1) to Intelligence Centre, Hong Kong. 10.12.21. W. E. C. B. C. Forsyth, to Aircraft Depot, Egypt, (Middle East Area). On ceasing to be attached to R.A.F. Depot. 1.12.21. J. V. Read, M.B.E., from Inland Area Aircraft Depot (Inland Area)

to R.A.F. Cadet College (Flying Wing) (Cranwell). 9.1.22. G. E. Wilson, from Central Flying School (Inland Area) to half-pay list. 28.11.21. A. J. Elliott, from Instrument Design Establishment (Inland Area) to School of Photography (Inland Area). 16.1.22. H. A. Tweedie, O.B.E., A.F.C., from No. 7 Group Headquarters (Inland Area) to British Delegation (Air Section) Paris. 4.1.22.

*Flying Officers.*—G. F. Mackay, to R.A.F. Depot (Inland Area). (Supernumerary). On appointment to short service commn. 12.12.21. B. A. Davy, to R.A.F. Depot (Inland Area). (Supernumerary). On appointment to short service commn. 13.12.21. G. G. H. Du Boulay, to R.A.F. Depot (Inland Area). (Supernumerary). On appointment to short service commn. 12.12.21.

## LEGAL INTELLIGENCE

### Ruffy Arnell and Baumann Aviation Co., Ltd., v. The King

MR. JUSTICE McCARDIE, in the King's Bench Division on December 20, in his considered judgment of the action by petition of right brought by the plaintiff company against the Crown to recover damages for alleged breach of contract in closing down their school at Acton for the elementary training of flying officers in the Royal Air Force, found for the plaintiffs on their claim, awarding £250 damages and half their taxed costs, and for the Crown on the counter-claim for £1,227.

The case put forward for the plaintiffs was that a contract dated in August, 1916, was entered into between them and the War Office, whereby they should convert their aerodrome at Acton into a school for the elementary training of flying officers, and so use it "for the duration of the War." They spent many thousands of pounds in procuring land, making a flying ground, building hangars, and providing machines, and at certain periods they had as many as fifty pupils. On June 22, 1918, the Air Council gave notice to determine the contract as and from July 1, 1918, and they removed the hangars and left the machines in the open.

Mr. Upjohn stated that apparently the reason for the notice was that the Air Council had changed their method of instruction, substituting for elementary training with various machines training with war machines. The defendants claimed power to terminate the contract at the date mentioned; that the school was used to its full capacity up to that date; and that proper payment was made. They also pleaded that the instruction given was inadequate, and given by inefficient instructors, and that the plaintiffs' machines were obsolete. Counsel proposed to call evidence to show that the officers were as efficient as those at any similar training school in the country, that the closing down involved the plaintiffs in heavy loss, and that no complaints were made prior to the notice to close down being given.

Mr. Justice McCardie, giving his judgment and dealing with the general claim, said the suppliants in 1917 enlarged their school at great expense, and the War Office increased the number of pupils sent there. Again and again suppliants asked for more pupils, and the War Office did increase the numbers, and, in 1918, they also increased the grant per pupil from £100 to £135, which, with the original bonus, made a total of £160

for every pupil passed as qualified. In the early part of 1918 the Air Council took over the control of aviation from the War Office, and in June of that year they wrote to the suppliants that in consequence of changes which had taken place in training requirements for the Royal Air Force, it had been decided to terminate existing agreements, and they gave suppliants five days' notice to terminate the agreement with them. The Air Council wrongly believed the contract contained a clause giving them power to terminate the agreement any time. There was such a clause in contracts with other aviation schools, but in this particular case the contract was for the duration of the War.

No further pupils were sent after the notice had been given, and in that, observed his lordship, the Crown committed a breach of contract. He therefore held suppliants were entitled to damages for breach of contract, but their claim had been grossly exaggerated—£40,000 per annum for the duration of the War. The parties contemplated as the duration of the War the substantial continuance of hostilities, but he held that the proper and just date at which substantial hostilities ended was December 14, 1918, at which time the military power of Germany had been broken. He estimated that out of the £160 suppliants received per pupil their profit was £30 each on 120 pupils. That was the utmost they could claim. But that was subject to the Crown's contention that they were justified in not sending more pupils because of the inefficiency of the school.

He could not award damages to suppliants for actual loss of pupils from June 30, 1918, to December 14, 1918, but on the general question of damages they were entitled to a nominal sum for the sudden termination of the contract without adequate notice. He could not overlook the fact that additional pupils were sent after January, 1918, and that the amount paid per pupil was increased. That illustrated the regrettable isolation of one department of the Ministry from another, and the lack of co-operative organisation between them. He fixed the sum for general charges to be awarded the suppliants at £250, and directed that their costs should be taxed and that the Crown should pay half those costs. There would be judgment for the suppliants on the petition for £250, and the costs as stated, and for the Crown on their counter-claim for £1,227 for goods supplied to the suppliants by the Ministry of Munitions.



## SIDE-WINDS

It is now possible to travel from London to Switzerland by air, thanks to the inauguration by LepAerial Travel Bureau, of Piccadilly Circus, of a weekly service linking up with the Paris-Lausanne service. At present, departures are scheduled for Friday from London, the night being spent in Paris, whence passengers proceed on Saturday morning. The actual flying time is approximately 5½ hours, and the fare is £14 6s. single and £27 return.

As an outstanding example of fine art work in Christmas Greetings, we must place foremost the imposing "card" sent us by Sir Charles and Lady Wakefield. The reproduction of Clarkson Stanfield's "The Opening of London Bridge by William IV, August 1, 1831," the original of which is in the collection of Sir Charles, is a specimen of high art work. It is one of the few reproductions we have seen, really worth framing. Our hearty reciprocation of good-will and season's greetings to Sir Charles and Lady Wakefield for their souvenir.

AMONGST the 1922 Calendars received is a very beautiful example of colour printing, "The Spirit of the Hills," from Shell-Mex, Ltd. It is not only a picture, but the way in which the "spirit"—needless to say *what* spirit—is introduced into and above the hills, is an inspiration.

FIAT MOTORS, LTD., send us a very useful little memo-pad of the "Kinco" order. It is a permanent "noter," and therefore an everlasting reminder of "Fiats," which is really what matters. But wisely, the little advt. "tablet" which says "Fiat" is so non-aggressive as to render the pad a fitting addenda to one's personal writing-table.

As the speed of aeroplanes increases and machines become correspondingly sensitive to the controls, the question of instruments assumes greater and greater importance. Not only do the instruments have to be very sensitive, but, owing to the extreme manoeuvrability, they may be subject to gravity and centrifugal loads, which may assume considerable proportions. It is not, therefore, without interest to know that in his wonderful test flights at Martlesham, Mr. J. H. James had the Gloucestershire "Mars I" fitted with instruments by S. Smith and Sons (M.A.), Ltd. The reputation of Smiths' Aviation instruments is such that this is not to be wondered at, but it may be somewhat surprising to learn that in the very complete set were included some instruments not always carried. Thus, in addition to the usual revs. indicator, airspeed indicator, compass, pressure gauges, clinometers, watch and altimeter, James carried a density meter, and a radiator thermometer. Owing to the reliability of the Smiths' instruments, he was able to know constantly exactly what his machine and engine were doing, and this must have contributed in no small measure to his success.

OWING to the Christmas rush, our issue of last week had to be sent to press earlier than usual. Consequently, in some instances, there was no time to submit proofs of advertisements before publication. A case in point is the advertisement of the Gloucestershire Aircraft Co., Ltd., in which, inadvertently, James's flight at 212 m.p.h. was claimed as a world's record. This was due to a misunderstanding over the telephone, as, of course, the flight is not recognised as a record until it has been homologated. The blame for prematurely making the claim on the world's record, must, we think, be laid at the door of old Father Christmas.

### Gordon-Bennett Balloon Race, 1922

Alteration No. 1: It is now announced that the above contest will start from Geneva on August 6, instead of September 2.

### Progress of Civil Aviation

JUST as we are going to press, we receive a copy of the half-yearly report of the Controller-General on the progress from April 1 to September 30, 1921. The report contains some very interesting matter and statistics, and we hope to deal with it in our next issue.

## IN PARLIAMENT

### Air Engines (Silencers)

CAPT. W. BENN, on December 15, asked the Secretary of State for Air whether his attention has been called to the invention of a new silencer for air engines; and whether there is any likelihood of its general adoption?

Capt. Guest: I do not know whether the hon. Member is referring to any particular type of silencer. I may say that various types have, from time to time, been brought to the notice of the Air Ministry, and that, of these, the more promising ones are subjected to tests, including full-scale tests on actual aeroplanes, and that these tests are still proceeding at the Royal Aircraft Establishment, Farnborough.

## PUBLICATIONS RECEIVED

*Calendar*, 1922. City and Provincial Supplies Co., 9, Church Row, Aldgate, London, E.C.

*Illustrated Calendar*, 1922. Shell-Mex, Ltd., Shell Corner, Kingsway, London, W.C.2.

*Calendar*, 1922. Harrison, Jehring and Co., Ltd., Emerald Street, London, W.C.

*Some Points in Flying Boat Design*. By Alexander Thom, B.Sc., Institution of Engineers and Shipbuilders in Scotland, Elmbank Crescent, Glasgow.

*Fifty Years of Travel by Land, Water and Air*. By Frank Hedges Butley. Second Impression. London: T. Fisher Unwin. Price 21s. net.

*Rendiconti dell' Istituto Sperimentale Aeronautico*. Series 2, No. 3. Tipografia del Senato di Giovanni Bardi, Rome. Price L. 25.

*Application de la Resistance des Materiaux au Calcul des Avions*. By M. Boileve. Gauthier-Villars et Cie., 55, Quai des Grands-Augustins, Paris. Price 30 fr.

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## AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: cyl. = cylinder; I.C. = internal combustion; m. = motors. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

### APPLIED FOR IN 1920

Published December 15, 1921

- 21,047. LUFTFAHZEUGBAU SCHUTTE-LANZ. Electro-magnet for locking devices. (154,914.)
- 25,030. G. L. SMITH and J. P. BROWN. Gyroscopic turn-indicators. (171,513.)
- 25,604. C. TUCKFIELD. Feathering-propeller for flying-machines. (171,533.)
- 25,613. SUNBEAM MOTOR CAR CO., LTD., and L. COATALEN. Transmission gearing for aircraft, etc. (171,534.)
- 27,740. BOULTON and PAUL, LTD., and J. D. NORTH. Wings, aerofoils, etc. (171,572.)
- 28,744. E. S. G. REES. Apparatus for manoeuvring aircraft, etc. (171,600.)

Published December 22, 1921

- 17,127. ZAHNRADFABRIK GES. and GRAF A. VON SODEN-FRAUNHOFEN. Control mechanisms for variable speed gearing, bomb-droppers, etc. (146,278.)
- 21,893. SIEMENS-SCHUCKERTWERKE GES. Synchronous motors. (171,412.)
- 24,337. W. H. BARLING. Spars, beams, etc., for aircraft. (171,779.)
- 26,174. SOC. LATHAM ET CIE. Aircraft control. (150,972.)
- 26,255. F. C. DONS. Flying-machines. (150,978.)
- 36,365. R. E. CAREY. Instrument for ascertaining correct course of aircraft etc. (171,917.)

### APPLIED FOR IN 1921

Published December 15, 1921

- 4,335. G. FORNACA. Device for cooling exhaust pipes. (171,643.)
- 6,238. J. D. SIDDELEY. Aircraft. (171,648.)

Published December 22, 1921

- 1,781. P. J. REUSER. Aerial machine. (157,977.)

If you require anything pertaining to aviation, study "FLIGHT'S" Buyers' Guide and Trade Directory, which appears in our advertisement pages each week (see pages iii and xiv).

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